

WHAT IS CLAIMED IS:

1. A parallel batch reactor for effecting chemical reactions, the parallel batch reactor comprising:

5 a pressure chamber;

an inlet port in fluid communication with the pressure chamber for pressurizing the pressure chamber from an external pressure source; and

a plurality of reaction wells, each of said plurality of reaction wells being in isolatable fluid communication with the pressure chamber such that during a first
10 pressurizing stage of operation, each of said plurality of reaction wells can be simultaneously pressurized through common fluid communication with the pressure chamber, and such that during a second reaction stage of operation, each of said plurality of reaction wells can be fluidically isolated from at least one other of said plurality of reaction wells.

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2. The parallel batch reactor of claim 1 wherein said plurality of reaction wells comprises at least two groups of reaction wells and wherein each group of reaction wells is fluidically isolated from the other group of reaction wells during the second reaction stage of operation.

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3. The parallel batch reactor of claim 2 wherein said groups of reaction wells are fluidically isolated from each other by a flow restriction device.

4. The parallel batch reactor of claim 2 wherein said groups of reaction
25 wells are fluidically isolated from each other by one or more check valves.

5. The parallel batch reactor of claim 2 wherein each of said groups of reaction wells are in fluid communication with an inlet check valve positioned between the pressure chamber and said group of reaction wells and operable to allow flow into

the reaction wells from the pressure chamber and restrict flow from the reaction wells into the pressure chamber.

5 6. The parallel batch reactor of claim 2 further comprising a cover operable to isolate each of the groups of reaction wells during the second stage of operation.

10 7. The parallel batch reactor of claim 2 wherein said plurality of reaction wells are arranged in an array.

8. A parallel batch reactor for effecting chemical reactions, the parallel batch reactor comprising:

a pressure chamber;

15 a base having a plurality of reaction wells, each of said reaction wells having a closed lower end and an open upper end for receiving components for the reaction;

a cover configured for sealing engagement with the base to form a housing enclosing said plurality of reaction wells;

20 an inlet port in fluid communication with the pressure chamber for pressurizing the pressure chamber from an external source; and

a flow restriction device comprising a plurality of check valves each configured to allow flow from the pressure chamber into one or more of said plurality of reaction wells and restrict flow from the one or more reaction wells into the pressure
25 chamber.

9. The parallel batch reactor of claim 8 wherein said plurality of reaction wells comprises at least two groups of reactions wells and the flow restriction device is operable to fluidically isolate the groups of reactions wells from one another.

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10. The parallel batch reactor of claim 9 wherein said plurality of check valves comprises inlet check valves positioned between the pressure chamber and each of said group of reaction wells.

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11. The parallel batch reactor of claim 8 wherein said plurality of check valves are contained within the cover.

12. The parallel batch reactor of claim 8 wherein material and structure
10 of the pressure chamber is such that the chamber is operable to sustain an operating pressure above 40 psig.

13. The parallel batch reactor of claim 8 wherein the flow restriction
15 device further comprises a plurality of outlet check valves, each of said plurality of outlet check valves positioned between one or more of said plurality of reaction wells and an outlet port.

14. A parallel batch reactor for effecting chemical reactions, the parallel
batch reactor comprising:
20 a pressure chamber;
an inlet port in fluid communication with the pressure chamber for
pressurizing the pressure chamber from an external pressure source; and
at least two groups of reaction vessels, each of said groups comprising a
plurality of reaction vessels and each of said groups of reaction vessels being in
25 isolatable fluid communication with the pressure chamber such that during a first
pressurizing stage of operation, each of said groups of reaction vessels are configured
for pressurization through fluid communication with the pressure chamber, and during a
second reaction stage of operation, said at least two groups of reaction vessels are
isolated from one another.

15. The parallel batch reactor of claim 14 wherein the pressure chamber comprises a cover configured for sealing engagement with a base, and said at least two groups of reaction vessels are an array of reaction vessels formed in or supported by a common substrate, the base being adapted for receiving the array of reaction vessels.

16. The parallel batch reactor of claim 14 wherein said at least two groups of reaction vessels are configured for pressurization through the pressure chamber to a pressure ranging from approximately 10 psig to approximately 1500 psig.

17. The parallel batch reactor of claim 14 further comprising at least two outlet check valves, including at least one outlet check valve associated with each of at least two groups of reaction vessels, the outlet check valves isolating its associated group of reaction vessels from one another during the second reaction stage of operation.

18. The parallel batch reactor of claim 14 wherein material and structure of the pressure chamber is such that the chamber is operable to sustain an operating pressure above 40 psig.